Environmental Studies Program: Ongoing Study

Title	Characteristics and Contributions of Noise Generated by Abrasive Cutting During Conductor-removal Operations (PC-20-x05)
Administered by	Pacific OCS Region
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Procurement Type(s)	Contract
Conducting Organization(s)	Tetra Tech, Inc.
Total BOEM Cost	$559,386 Note: BOEM funding is from the Environmental Studies Program ($225,000), Pacific OCS Office ($259,686), and Gulf of Mexico OCS Office ($74,700).
Performance Period	FY 2020–2022
Final Report Due	March 17, 2022
Date Revised	August 26, 2021
PICOC Summary	
Problem	There is currently no empirical data available on the sound source levels, sound propagation characteristics or particle motion induced by high-pressure abrasive cutting methods during conductor removal associated with oil platforms. This lack of data limits BOEM's ability to accurately assess impacts to protected species under NEPA, ESA, and MMPA.
Intervention	Collect empirical data during high-pressure abrasive conductor cutting.
Comparison	This study will collect and compare acoustic data before, during, and after cutting conductors in order to assess the acoustic contributions of these activities to the soundscape.
Outcome	A more accurate understanding of the potential acoustic impacts of high-pressure abrasive cutting used during conductor removal to marine protected species, which will inform applicable and appropriate mitigation strategies.
Context	Pacific and Gulf of Mexico OCS Regions

BOEM Information Need(s): It is important for BOEM to collect empirical data on the characteristics of sound and particle motion generated by these BSEE-permitted activities in order to more accurately and responsibly analyze the potential impacts of these impacts in environmental documents that fulfill BSEE's and BOEM's regulatory responsibilities. In addition, this type of data is critical in ensuring BOEM and NMFS adopt applicable and effective mitigation strategies.

Background: BOEM is required by the Endangered Species Act (ESA), Marine Mammal Protection Act (MMPA), and the National Environmental Policy Act (NEPA) to assess the potential of conventional energy activities to cause impacts to, and apply appropriate mitigation for the protection of, marine wildlife. Since marine mammals and other marine species use sound as the primary means of communicating, navigating, and foraging, the potential that anthropogenic noise could harm these species or significantly interfere with their normal activities is an issue of increasing concern. Additionally, there is growing knowledge that particle motion is critical to understanding the importance

of sound to fishes and invertebrates, as are the levels at which particle motion may have potentially adverse effects in terms of increased mortality, injury to tissues, effects on hearing abilities, and/or changes in behavior and physiology.

There are currently 23 oil platforms in Federal waters offshore southern California, all of which will be decommissioned in the near future. In preparation for decommissioning, the Bureau of Safety and Environmental Enforcement (BSEE), BOEM's sister agency, received Applications for Permit to Modify (APMs) (30 CFR Part 250.1723) from Freeport-McMoRan Oil and Gas LLC ("Freeport") to remove well conductors and casings on the Point Arguello Unit Platforms Hermosa, Harvest, and Hidalgo, offshore Santa Barbara County, California. Conductor cutting is expected to utilize high-pressure abrasive cutting methods for the initial cut. Per BSEE requirements, initial cuts will be made approximately 15 feet (ft) below the mudline. There is currently no empirical data available on the sound source levels, sound propagation characteristics, or particle motion induced by high-pressure abrasive cutting methods during conductor removal associated with oil platforms. Due to the lack of empirical data, it is unclear whether any mitigation is necessary or whether some mitigations might be more effective than others.

Objectives:

1. Quantify the sound pressure level for high-pressure abrasive cutting during conductor removal.
2. Determine the distances, and at what levels, sound from high-pressure abrasive cutting propagate.
3. Describe, and to the extent possible, quantify the ambient soundscape prior to, during, and after high-pressure abrasive cutting.
4. Determine whether high-pressure abrasive cutting contributes to the ambient soundscape, and if so, provide a quantification of that contribution.
5. Quantify particle motion during conductor removal, using high-pressure abrasive cutting, including amplitude and directionality in 3D and time.

Methods: Underwater sound monitoring should be conducted in a way that best fulfills the need for future environmental compliance analyses under the NEPA, ESA, and MMPA, and in accordance with the latest NMFS acoustic guidance. At a minimum, we expect that there will be appropriate acoustic measurements taken before, during, and after 1 initial abrasive conductor cutting operation, at a single platform. Technical expertise will be required to develop a field plan that provides information on the most effective study design and execution thereof, in order to achieve the objectives of this study.

Ambient oceanographic conditions shall be measured on each sampling day, including conductivity, depth, and temperature in order to contribute to our general understanding of ambient conditions as they relate to the ocean soundscape.

Particle motion will be measured using the most up-to-date guidance for disturbance thresholds for fish before, during, and after initial abrasive conductor cutting. BOEM recognizes that this type of measurement is challenging and that there may be several methods for measurement. These measurements shall not hinder or interfere with conductor-removal activities.

Specific Research Question(s):

1. What is the sound pressure level for high-pressure abrasive cutting during conductor removal?

2. To what distances and at what levels does sound from high-pressure abrasive cutting propagate?
3. What is the ambient soundscape prior to, during, and after high-pressure abrasive cutting?
4. Does high-pressure abrasive cutting contribute to the ambient soundscape? If so, to what degree?
5. How is particle motion affected by high-pressure abrasive cutting during conductor removal?

Current Status: BOEM requested that the railroad wheels that were going to be used to anchor the recorders be retrieved. Tetra Tech, Inc. and contractors redesigned the retrieval system to accomplish that task. Research equipment was deployed on March 31, 2021. Equipment was deployed at six locations, which included the NoiseSpotter™ (particle motion monitor), six SoundTraps (passive acoustic monitors), and a thermistor chain. Locations of each deployment were carefully documented for the purposes of retrieval.

On April 22, 2021, the NoiseSpotter™ platform, thermistor chain, and two of the SoundTrap moorings were retrieved. Subsequently, the sea state increased, and the R/V Shearwater returned to the harbor. On April 23, 2021, the Project field team assembled and boarded the R/V Shearwater to collect the remaining equipment. The recovery operations were completed successfully with all the equipment retrieved.

Corruption of the solid state hard-drive on the NoiseSpotter™ resulted in the hardware being sent to an outside recovery firm that is currently working on recovering the data from the drive, and they are confident that they will be able to recover all the data. All other associated analysis is currently underway and on schedule.

Publications Completed: None

Affiliated WWW Sites: https://marinecadastre.gov/espis/#/search/study/100318

References: None